Station Groups for Execution Resource Sharing

8 ML Active Stations
8 DEE Active Stations
2 ML columns
2 DEE columns
4 sharing groups

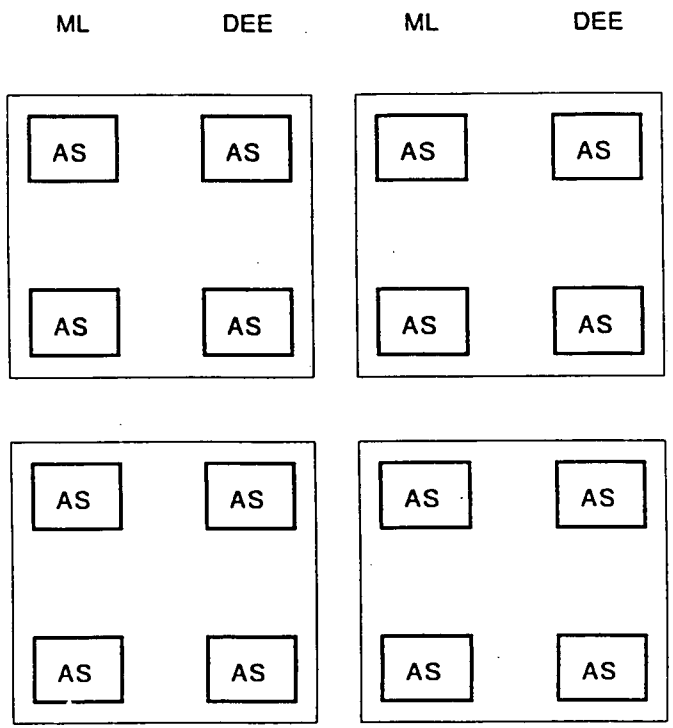


FIG. 1

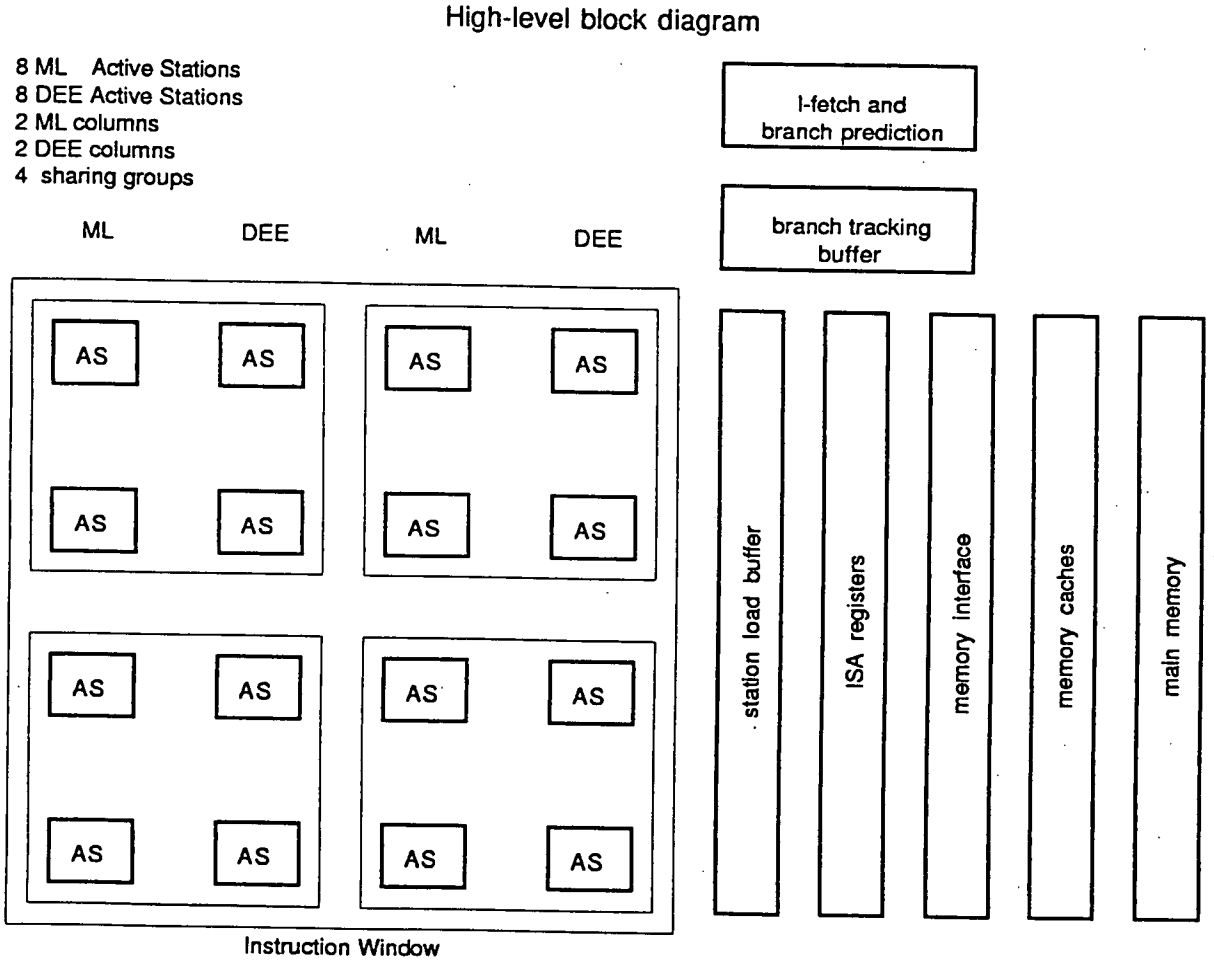

High-level block diagram
8 ML Active Stations
8 DEE Active Stations
2 ML columns
2 DEE columns
4 sharing groups
ML
DEE
ML
DEE
AS
I-fetch and branch prediction
branch tracking buffer
station load buffer
ISA registers
memory interface
memory caches
main memory
Instruction Window

FIG. 2

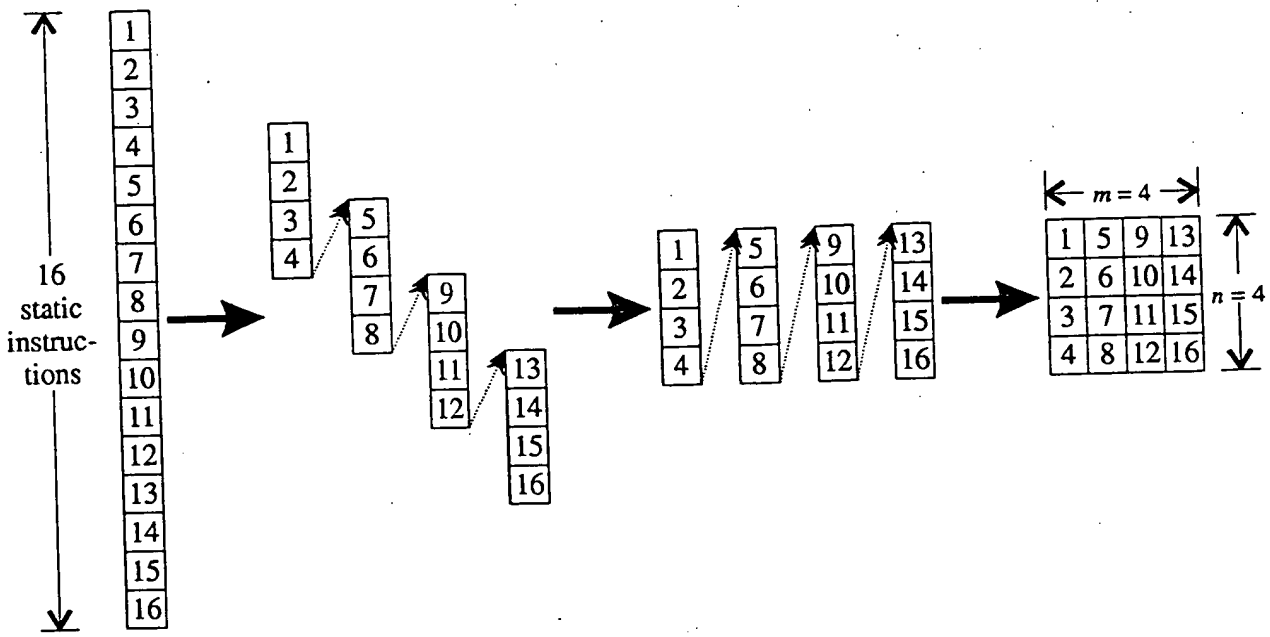
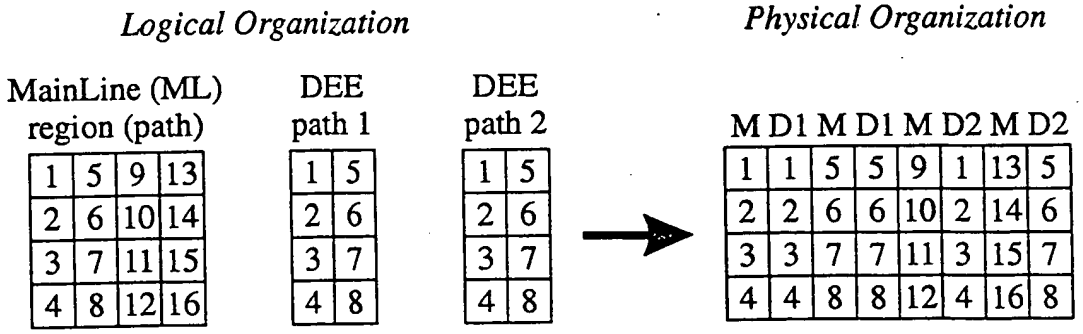


FIG. 3



Instruction Window (IW), with Disjoint Eager Execution (DEE)

- each square is an active station -

FIG. 4

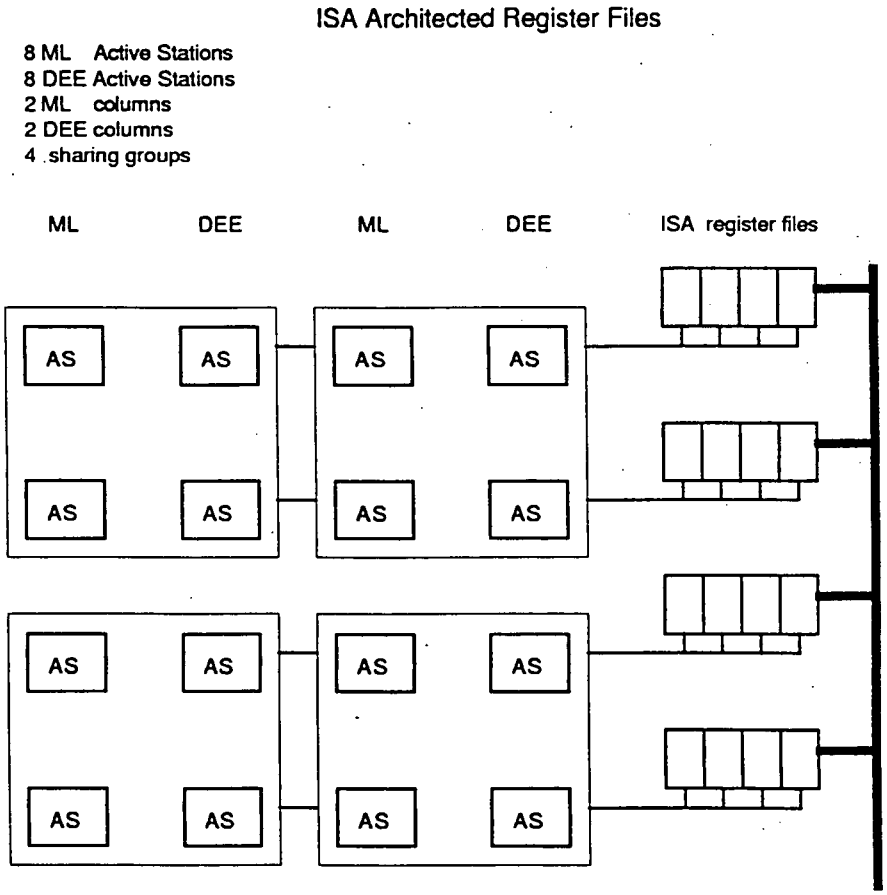

ISA Architected Register Files
8 ML Active Stations
8 DEE Active Stations
2 ML columns
2 DEE columns
4 sharing groups
ML
DEE
ML
DEE
ISA register files
AS
AS
AS
AS
AS
AS
AS
AS
AS
AS
AS
AS
AS
AS
AS
AS

FIG. 5

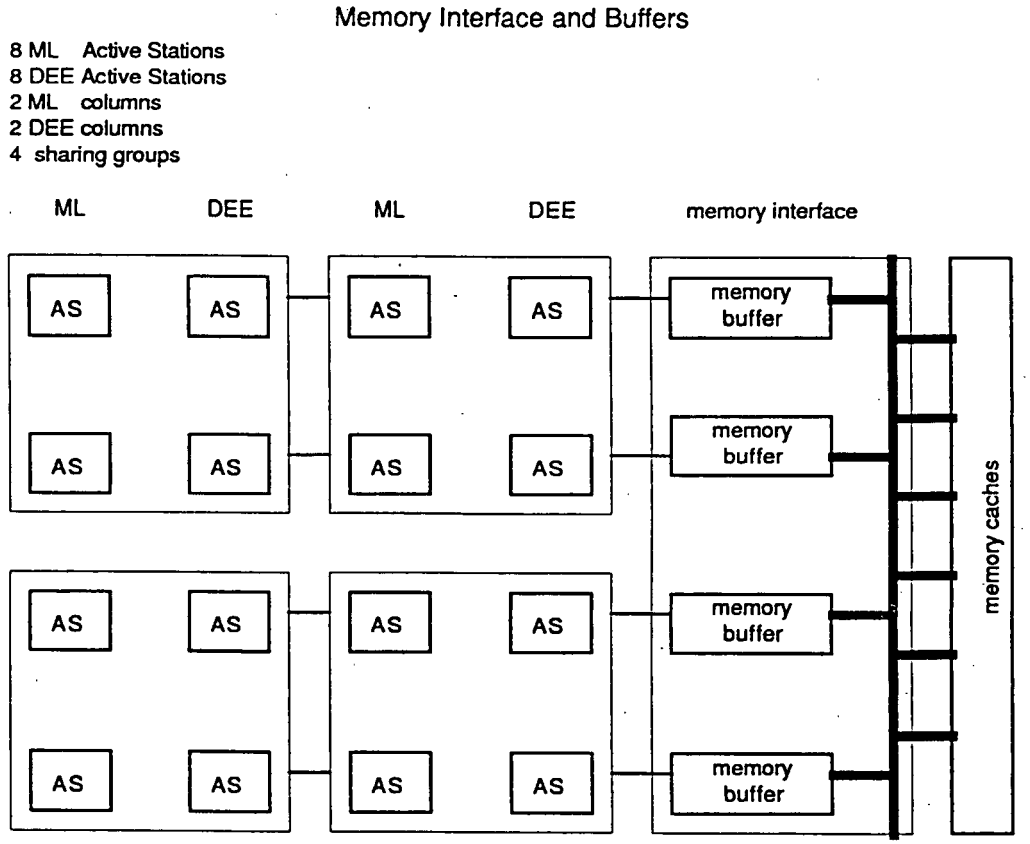


FIG. 6

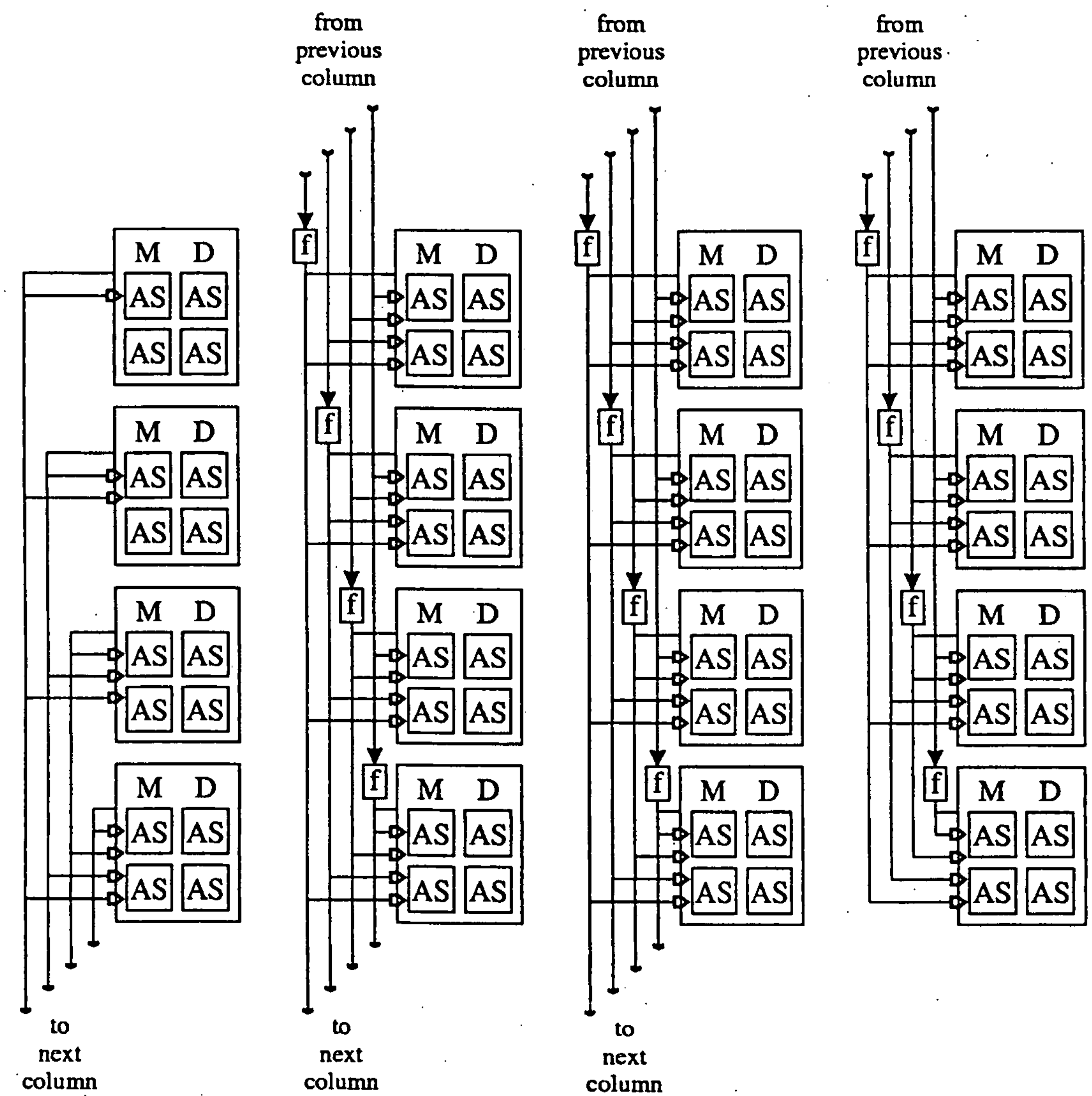


FIG. 7

Active Station Sharing Group and Connectivity

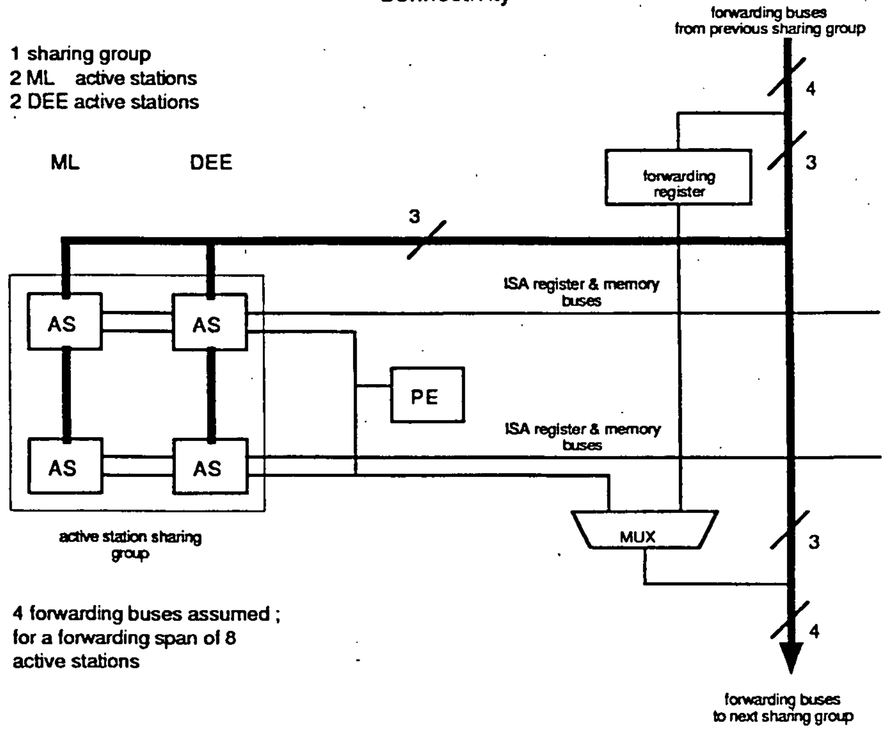


FIG. 8

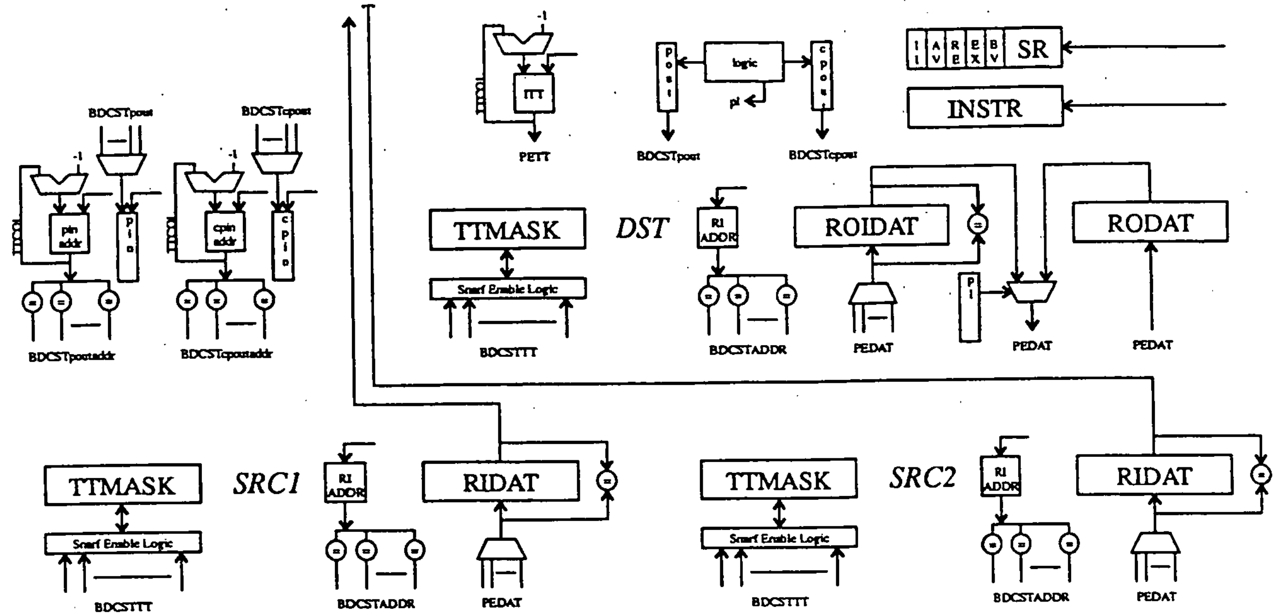

SR
INSTR
TTMASK
DST
ROIDAT
RODAT
PEDAT
Snarf Enable Logic
BDCSTTT
BDCSTADDR
BDCSTpout
BDCSTcpout
PETT
logic
SRC1
SRC2
RIDAT

FIG. 9

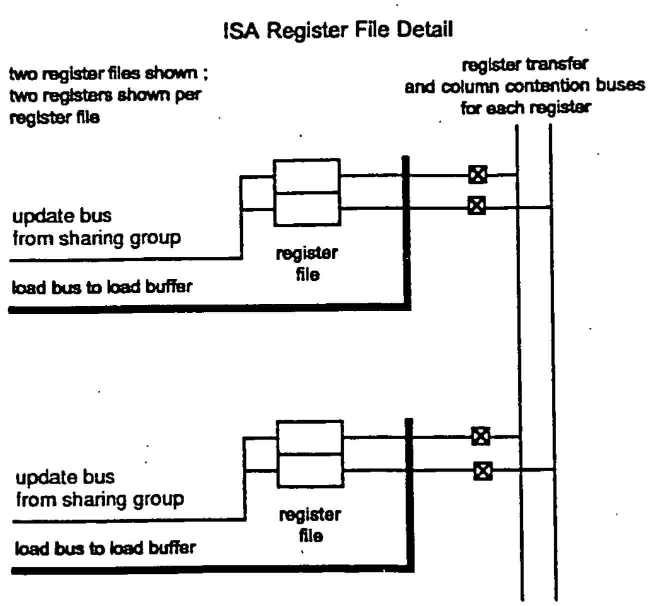

ISA Register File Detail
two register files shown ;
two registers shown per
register file
register transfer
and column contention buses
for each register
update bus
from sharing group
register
file
load bus to load buffer
update bus
from sharing group
register
file
load bus to load buffer

FIG. 10

time

instruction						
00	X					
10	X					
20	X					
30	X	X				

an 'X' marks an execution

FIG. 11

time

instruction						
00	X					
10	X					
20			X			
30		X		X		

an 'X' marks an execution

FIG. 12

time

instruction						
00		X				
10	X		X			
20	X					
30						

an 'X' marks an execution

FIG. 13

time

instruction	0	1	2	3	4	5	6
00		X				X	
10	X		X				X
20				X			
30		X	X		X		

an 'X' marks an execution

FIG. 14

Instruction \ time	0	1	2	3	4	5	6
000	X						
010	X		X				
020	X			X			
030	X				X		

an 'X' marks an execution

FIG. 15

instruction \ time	0	1	2	3	4	5	6
00	X						
10	X	X					
20	X		R				
30	X						

an 'X' marks an execution, an 'R' marks a relay operation

FIG. 16

Instruction \ time	0	1	2	3	4	5	6
00			X				
10				X			
20	X				R		
30		X				X	

an 'X' marks an execution, an 'R' marks a relay operation

FIG. 17

Instruction \ time	0	1	2	3	4	5	6
00	X				X		
10	X	X				X	
20	R		D				B
30	X						

an 'X' marks an execution, an 'R' marks a relay operation, an 'B' marks a broadcast-only operation, a 'D' marks an execution in a DEE path

FIG. 18